

INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE

2A & 2B , Raja S.C. Mullick Road, Jadavpur, Kolkata-700032

NIT No. : IACS/IC/AD/2018-19/5

Date: 18/04/2018

Sealed tender in two bids system (technical bid and price bid) is invited from bonafide, resourceful and eligible manufacturer/exclusive distributor/vendors for “**Mossbauer Spectrometer with liq. N2 cryostat for solid and solution measurements**”

Part-I (Technical Bid) of the tender should contain technical specifications in detail as well as commercial terms and conditions. Part-II (Price Bid) should clearly indicate group-wise price, if needed, as mentioned in the technical bid. The Technical Bid and Price Bid are to be submitted in separately sealed envelopes, distinctly marked accordingly and both to be put inside another envelop, that should be sealed and superscribed with tender notice no. and due date. The bidders may submit bids duly signed in their own letterheads.

Completed tender bids should reach the office of the **Registrar, Indian Association for the Cultivation of Science (IACS), 2A & 2B Raja S. C. Mullick Road, Jadavpur, Kolkata-700032** on or before the scheduled date and time specified below:

Tender Notice No.	NIT No. IACS/IC/AD/2018-19/5 Date: 18-04-2018
Last date and time of submitting tender	18 th May, 2018 12:30 p.m.
Pre-bid meeting(date, time & place) to discuss technical specification	11 th May, 2018 12:30-1:30 pm, Room 1, 2 nd floor, ERU building, IACS
Date and time of opening tender (Technical Bids)	21 st May, 2018 12:30 pm
Place of opening tender	Room 1, 2 nd floor, ERU building, IACS
Date and time of opening of Price Bid	The Price Bids of the bidders qualifying the technical bid will only be opened, the date of which will be intimated to the short-listed bidders at their email addresses. The rest of the bids will be rejected.
Contact	Email: icad@iacs.res.in Tel.+91 33 2473 4971 [Ext.1366]

The technical bids will be opened first to judge/evaluate the technical specifications of the said instrument and thereafter the price bids of only technically qualified bidders will be opened.

Technical Bid Evaluation: The Technical Bids will be evaluated in the presence of the representatives of intending bidders who will be able to clarify technical aspects of their bids, if any, required by the Technical Evaluation Team.

Opening of price-bid: The Price Bids of the bidders qualifying the technical bid will only be opened, the date of which will be intimated to the short-listed bidders at their email addresses. The rest of the bids will be rejected.

Please note that IACS will not provide any accommodation or reimburse any expenses to any of the bidders for attending opening of technical bid.

Quotations received incomplete or beyond the stipulated time will be summarily rejected.

Bidders should submit their past experience for supplying and successful installation of similar units to other research Institutes/Universities/other organizations in India and abroad. Please provide documentary proofs of such successful installation and supportive documents that the instruments are running successfully.

1. TECHNICAL BID

The technical bid should contain technical specifications and should be kept in a separate sealed envelope duly superscribed as 'TECHNICAL BID' on the outer cover of the envelope as already detailed above. **It should be clearly mentioned on the envelope as "Technical Specification for Mossbauer Spectrometer with liq. N2 cryostat for solid and solution measurements".**

Technical Specification for Mossbauer Spectrometer with liq. N2 cryostat for solid and solution measurements:

Mossbauer System with following components

1) Mossbauer Velocity Transducer

SPECIFICATIONS

- Magnets NdFeB and SmCo5
- Housing Steel, nickel plated
- Guide springs Fiberglass enforced epoxy
- Velocity Range 0 ... > 1000 mm/s
- Resonance frequency ~ 25 Hz
- Calibration constant ca. 25 mm/s per Volt
- Accuracy (at resonance frequency and normal load) +/-0.5 % in a sinusoidal mode
/1.5% in a triangular mode
- Linearity better than 0.15 % up to +/-100 mm/s

Physical

- Length 138 mm
- Diameter 108 mm

2) Digital Function Generator

SPECIFICATIONS

Inputs

ADO-INPUT	Pulse slope	Rising / Falling
	Pulse width	> 100 ns
Ext. Freq.	External frequency control	0-10 Hz
	Pulse Height	~ 5 V

Outputs

Analog Output		20 Vpp, (600 Ω)
CHA/START	Pulse Shape:	Rising / Falling (switchable)
	Pulse Height	~ 5 V
	Pulse Length	1 μs
	Impedance	50 Ω
CHA /Start	Pulse Shape:	Square
	Pulse Height	~5 V
	Pulse Length	1 μs
	Impedance	50 Ω

Count enable 5 V signal during the linear part of the analog output signal.
Impedance 50 Ω

Sign 5 V signal during the positive part of the analog Output signal.
Impedance 50 Ω

Indicators Dual colour light indicator for MODE

Controls

Channels Front panel 6-step rotary switch 128 - 256 - 512 - 1024 - 2048 - 4096
for selecting the number of channels

Mode Front panel 8-step rotary switch to
select the waveform of the analog
output signal: - SINE - TRIANGLE - CONSTANT VELOCITY (5 - 10 - 20 - -40 % slope)

Frequency Front panel 10-turn potentiometer to adjust the frequency within the range

Multichannel Scaling Front panel toggle switch for switching the channel sweep on or off

Physical Single width NIM module

3) Mossbauer Drive Unit SPECIFICATIONS

Controls

Velocity Front panel 10-turn potentiometer for velocity adjustment Front panel toggle switch to
reduce the range of adjustment to one tenth Front panel toggle switch for switching the
velocity transducer on or off

GAIN Front panel 10-turn trim potentiometer for adjusting the amplification of the feedback
loop

P Front panel 10-turn trim potentiometer for adjusting the control circuit whose signal is
proportional to the reference signal

I Front panel 10-turn trim potentiometer for adjusting the control circuit whose signal is
proportional to the integral of the reference signal
Front panel toggle switch for switching the above circuits on or off

Inputs

Analog Input 1 ... 12 Vpp
Start 2 20 V

Displays

Max. VELOCITY: 3 1/2 digit display for the maximum velocity (from 0.01 to 1999 mm/s)
ERROR: Analog LED line indicating the relative error in a logarithmic scale from 0.1 to 10 %

Outputs

Monitor Analog signal, proportional to the correct value of the velocity
~ 27 mV per mm/s with MA-260 ~ 40 mV per mm/s with Transducer

Error x 10 Analog signal, proportional to the difference between the actual and the correct value of the velocity.
~ 0.27 V per mm/s with MA-260 ~ 0.4 V per mm/s with Transducer

4) Proportional Counter SPECIFICATIONS

Gas Filling	Argon/ Krypton/ Xenon
Gas Pressure	1 at 47.8 mm Path Length
Cathode Material	Aluminium
Total Length (incl. MHV connector)	185.7 mm
Effective Length	1483 mm
Maximum Diameter	50.8 mm
Effective Diameter	47.8 mm
Connector	MHV
Operating Temp.	Range (°C) -40° to +75°

Window Specifications

Material	Beryllium
Areal Density	23
Thickness	0.127 mm
Diameter	25.4 mm
Oper. Voltage	~ 2 KV
Typical Resolution	(FWHM Cd109) 10%
Capacitance	3 pF

5) Preamplifier

Signal Input	Positive or negative charge pulses up to 5×10^{-9} Coulomb (3×10^{10} ion pairs)
Test Input	Positive or negative, voltage input, charge-coupled to preamp
Output	Output pulses should have inverted polarity relative to the input pulse
Rise-time	10 nsec at 0 pF to approx. 60 nsec at 300pF
Fall-time	approx. 100 μ sec
Amplitude	max ± 7.5 V
Connectors	Input, test input, Output, High voltage, Input from proportional counter

6) Amplifier

Should accept Positive and negative input pulses

Should Provide Bipolar output pulses

Should have Selectable shaping time with rotary switch 0.7, 1.5, 3.0, 6.0

Should Provide Preamplifier power output

Inputs	Front and rear panel BNC connectors accept positive and negative pulses from associated preamplifiers
Outputs	Front and rear panel BNC connectors provide bipolar pulses between ± 1 and ± 10 Volt. Max Amplitude of Output Signal: 10 V
Gain	Continuously variable from x4 to x2000

7) High Voltage Supply suitable for Proportional Counter

Output Front panel SHV connector
Regulated HV from 0 to 3 kV (6kV) 2 mA (1 mA) output current at max. voltage

Performance

Ripple and noise < 2mV at 1 mA

Overload and short circuit Protection No overvoltage on HV output due to overload or other disturbance of supply voltage. HV should return to the adjusted value. No time restriction for short circuit and overload.

8) Data Acquisition module should have following features

- The module should be suitable for operation with Personal Computers running under Windows 10
- Multichannel scaling (MCS) mode for measuring Mössbauer spectra
- Pulse height analysis mode using an integrated analog-to-digital converter
- An energy window, set in PHA mode, should be available in the MCS[window] mode when acquiring Mössbauer data
- Folding of Mössbauer spectra
- Evaluation of data from Mössbauer Velocity Calibrator
- Communication with PC by USB interface and RS-232C interface
- Power supply separate from PC: Data acquisition should be continued when the PC is switched off. In case of power failure the acquired data should be stored for more than 4 days
- Should be Flexible and service-friendly by highly integrated circuit

SPECIFICATIONS

Inputs	Analog Input	ADC
	Digital Input	COUNT, START, CHA, CE

Indicators DA ON, COUNT, ADC, START, POWER, CHA, CE, USB

Operating Modes

PHA, MCS, MCS[window]

PHA	Analog-to-Digital Conversion of analog input pulses Peak detection fully digital 1 - 10 V analog input. 1024 – 8192 channels (8192 channels with interpolation (oversampling)) Sampling frequency: 48 MHz
MCS	Digital input pulses max. 8192 channels per sweep count frequency > 100 MHz max. channel-advance-frequency: approx. 500 kHz
Communication Ports	RS-232C port 115.500 baud USB port USB 1.1 specifications

- 9) **NIM Bin Power Supply** Suitable NIM Bin Power supply to house the NIM modules ~ 200 Watt
- 10) **Set of cables** All necessary cables
- 11) **Source Adapter for Velocity Transducer and all necessary shielding adapters**
- 12) **Calibration Foil should be provided**
- 13) **Mossbauer Bench** Suitable rugged bench with Cryostat Stand
- 14) **Mossbauer Source** Please quote 50 mCi in Rh matrix whichever suitable
- 15) **Normos-A Mossbauer Fit Programmes SITE & DIST + IGOR PRO**
- 16) **Mössbauer Cryostat for Liquid Nitrogen**

The Liquid Nitrogen Bath Cryostat should be suitable for low-temperature Mossbauer spectroscopy with the Mossbauer source at ambient temperature. The cryostat should be entirely made of stainless steel. A temperature sensor should be there to provide input to the temperature controller. The Bath Cryostat should have following features.

- Temperature range from 56 K (by pumping off N₂ gas) up to 330 K
- Temperature gradients less than 0.3 K (sample in N₂ atmosphere)
- Top-loading Mossbauer cryostat
- Easy sample change in cold condition
- Sample holder with a cylindrical hole of $\varnothing = 20$ mm for sample insert
- Temper Stability: equal or better than 0.3 K
- LN₂ Volume: 18 L
- LN₂ Hold time: 15 days

- 17) **Duo 3 Rotary Vane Pump with accessories**
- 18) **Suitable Turbo Molecular Pump including Vacuum Meter and accessories**
- 19) **Suitable Temperature Controller**

The temperature controller should be suitable for controlling the temperature of samples in the above Mossbauer cryostat. Minimum programmable temperature: 77 K

- 20) **Installation** Installation and demonstration to be done by supplier

Warranty: Minimum 1 year while 3 years extendable warranty is preferred.

Servicing facility within India is a must while service engineer stationed at Kolkata will be preferred.

A list of other places where the instrument has been installed should also be provided. The vendor should have at least three previous successful installations of Mossbauer spectrometer in the country.

A compliance table (see below) must be prepared and submitted along with the technical bid.

Sr. No	Tender specification	Your offered instrument specification	Extent of compliance

Tender will not be accepted if the technical compliance chart is NOT provided following the above format.

2. PRICE BID

The financial bid indicating (item-wise) price for the item(s) mentioned in the technical bid should be kept in a separate sealed envelope duly super scribed as 'PRICE BID' on the outer cover of the envelop as already detailed above. Price bids of only technically qualified bidders will be opened and they will be intimated the date and time of the opening of price bid at their e-mail ids. Rest of the bidders will stand rejected.

PRICE: Price to be quoted on CIF Kolkata and also FOB basis.

3. BID SECURITY:

a. An Account payee Demand Draft of any of the Commercial Banks for Rs. 4,50,000 (Rupees four lakh fifty thousand only) drawn in favour of "Indian Association for the Cultivation of Science (State Bank of India, Jadavpur University Branch, A/C No. 11079699211, IFSC: SBIN000093, MICR Code: 700002048)" is to be furnished by the bidders alongwith Technical Bid, except Micro and Small Enterprises (MSEs) as defined in MSE Procurement Policy issued by Department of Micro, Small and Medium Enterprises (MSME) or are registered with the Central Purchase Organisation or the concerned Ministry or Department.

Alternatively, the bidder shall have the option to furnish EMD in the form of Fixed Deposit Receipt, Banker's Cheque or Bank Guarantee from any of the Commercial Banks. The Bid-Security should have at least 90 (ninety) days validity period beyond the final bid validity period.

In case of non-award of the work the Bid Security money would be returned to the unsuccessful Bidders.

4. PERFORMANCE SECURITY:

An Account Payee Demand Draft on any nationalized bank of India or Bank Guarantee (BG) of any Indian Nationalized Bank preferably located at Kolkata of 10% of the order value in the name of "Indian Association for the Cultivation of Science" is to be furnished by the successful bidder as Performance security. Performance security money should remain valid for a period of 60 days beyond the date of completion of all contractual obligations of the supplier including warranty obligations. Bid security money or EMD will be refunded to successful bidder on receipt of the Performance security money.

5. TERMS OF PAYMENT:

Payment will be made through irrevocable Letter of Credit in two instalments. 90% of the money will be released on submission of shipping of documents. Remaining 10% will be released after successful installation of the instrument.

6. GENERAL INSTRUCTIONS:

1. Validity of tender: Tender submitted should remain valid for at least six months from the date of opening the tender. Validity beyond six months from the date of opening of the tender shall be lapsed by mutual consent.
2. The tender should accompany a compliance chart.
3. Incomplete and conditional tenders as well as tenders received after the due date will be summarily rejected without assigning any reasons thereof.
4. At any time prior to the bid due date, IACS may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder during pre-bid meeting, modify the bidding documents. The amendment(s) will be notified on the institute website. Prospective bidders are advised to occasionally to visit the website (www.iacs.res.in/tender) for any amendment.
5. Installation/Demonstration/Application training at site: Installation & user training at IACS, free of cost by the supplier.
6. Service facility: In India, preferably Kolkata, supplier should mention their details of service setup and man powers who are responsible for after sales support. Response time should be within 24 hrs.
7. The model number, make and a printed literature of the product should be submitted positively.
8. Proposed delivery schedule should be mentioned clearly.
9. Manufacturers / exclusive distributors / vendors should have history of supplying this type of instruments to this or other scientific organizations. Availability of a list in this regard would be preferred.
10. Authorized dealership certificate should be provided in case of principal manufacturing company is not quoting directly.
11. Guarantee certificate, users manuals etc. are to be handed over to the user after successful commissioning of the system.
12. In the event of date being declared a closed holiday for purchaser's office, the due date for submission of bids and opening of the technical bids will be the following working day at the appointed time.
13. In case of any dispute, the decision of IACS authority shall be final and binding on the bidders.
14. In case of any litigation the matter will be dealt within the jurisdiction of the High Court of Calcutta only
15. For any clarification regarding technical specifications, information etc., please send your queries to Abhishek Dey (icad@iacs.res.in).
16. The authority of IACS reserves the right to reject any or all of the tenders received without assigning any reason thereof.

Acting Registrar